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Attachment to:
TCS-8065/68

Information Concerning Bi-Spectral Acquisitions and Bicolor Viewing Methods

Several passes of Mission [] are exposed in the bi-spectral mode of acquisition. Bi-spectral coverage refers to a technique of acquiring conjugate imagery with two cameras, each using a filter which has its peak transmission in different portions of the visible spectrum. In this case, a red filter was used on the forward camera and a green on the aft. In acquiring photography in this manner, the density of images on the black and white records is related to the filters through which they were exposed.

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To exploit the advantages of bi-spectral photography, the two black and white records can be analyzed individually with respect to the colors which the density represents. I.E., objects on the fwd (red filter) record which appear relatively light (low density) on the DP compared to the same image on the aft (green filter) record can be assumed to be reflecting in the red end of the spectrum. However, these conclusions cannot be accepted as absolute. The angle of the sun relative to the taking lens, atmospheric attenuation, exposure, and reproduction characteristics must also be considered. Even under optimum conditions, the color of an object can only be established as being warm (red or near red) or cool (green or toward the blue end of the spectrum).

In order to facilitate the readout of bi-spectral information, the photography can be viewed in a color mode referred to as "bicolor". Bicolor is a pseudo color generated from two colors of the spectrum instead of three, as is necessary for "natural" color. In order to create bicolor imagery, the black and white (DP) records from both cameras (fwd and aft panoramic) are projected onto a common surface, in register, through filters comparable to those used in the taking situation (fwd through red - aft through green). Information available by this technique will be similar in scope and value to that gained from the bi-spectral records viewed independently. However, the bi-spectral information becomes more readily apparent and a faster readout is possible. Red or warm tones will appear red or some variation thereof; green or cool tones will appear predominantly green.

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The problem of employing the bicolor method of exploitation is that the images must be appropriately filtered and projected in register. The geometry of the KH-4B camera is such that the imagery must be rectified in order to be successfully registered over areas larger than approximately 0.1 X 0.1 mm.

Although NPIC has one prototype bicolor viewing instrument - the Ares - available, the Center is not currently prepared to produce color prints from the bi-spectral imagery on a production basis for the Community.

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